NBCKC Monitoring Practices for Boreal Caribou

INDIRECT METHODS
FECAL SAMPLING

HOW DOES IT WORK?

- Study areas are surveyed (usually systematically) in winter by fixed-wing aircraft to collect fecal pellet samples. Surveys are conducted systematically for estimation of population size and trend, but may also be collected opportunistically for other purposes.
- Genetic tags (unique DNA sequences) can be extracted from the fecal pellets to identify individuals and/ or sex.
- Progesterone hormone levels can be used to assess whether an individual is pregnant

Photo credit: Samanta McFarlane & Govt of AB

WHAT CAN BE MEASURED?

- Genetic tags, in combination with capture-recapture (CR) analyses, can be used to assess population abundance, population trend and demographics.
- Fecal-DNA can also be used to estimate additional population parameters and processes such as diet, fitness, genetic diversity, dispersal, and population connectivity.

WHAT (AND WHO) IS REQUIRED?

- Costs include sampling kits and coolers for specimen collection, aircraft fees and fuel, as well as associated expenses for laboratory-based genetic analysis.
- Personnel required include: aircraft observers trained in caribou sign detection; field crew trained in fecal pellet collection; laboratory technicians trained in DNA extraction and genotyping analysis.
- Sampling can be led local by communities and informed by Indigenous Knowledge.

WHEN CAN IT BE USED?

Use: Fecal-DNA based CR studies are best suited for broad- scale studies on population abundance and demography, while non-CR genetic or hormone studies conducted at smaller scales, can be valuable for examining individual fitness, familial relationships, gene flow, and pregnancy rates.

Avoid: Fecal-DNA based CR studies are not intended for fine-scale sub-population-level abundance surveys. Fecal sampling is only recommended in winter, as fecal-DNA degrades at warm temperatures.

Previous boreal caribou application: In several regions, population abundance and trend have been derived from fecal-DNA-based capture-recapture studies, and reproductive hormones analysis from fecal samples has been used to estimate pregnancy rates of caribou. The technology is used extensively in Canada, is fairly robust, and provides reasonable/reliable information in provinces where the data are collected.

KEY CONSIDERATIONS

- The lack of animal contact involved in this approach is advantageous where non-invasive methods are preferred.
- Fecal samples can be collected by non-specialist trained participants.
- Fecal-DNA based CR (capture-recapture) or SCR (spatial capture-recapture) analyses generate robust population abundance and demographic estimates if standardized protocols are followed.

Cost:	Logistical Complexity:	Capture/Handling:
$ -$$$	SIMPLE-COMPLEX*	NO

*Logistical complexity is considered Simple for sample collection but Complex for data analysis

For more information, including regional subtleties and method particularities, please refer to decision tree, detailed write-ups and suitability tables 1 and 2. The information contained in this factsheet is intended for rapid communication and summary purposes only.

Photo credit: Laura Finnegan